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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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PALMER & DODGE, LLP
KATHLEEN M. WILLIAMS
111 HUNTINGTON AVENUE
BOSTON, MA 02199

EXAMINER	
KAM, CHIH MIN	

ART UNIT	PAPER NUMBER
1653	

DATE MAILED: 01/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/689,952	PELLETIER ET AL.	
	Examiner	Art Unit	
	Chih-Min Kam	1653	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *26-33,35 and 53-73* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *26-33,35 and 53-73* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *01/25/01* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. The amendment and response to notice to comply with sequence requirement filed August 6, 2002 is acknowledged, and CRF has been entered.

Election/Restrictions

2. In the response to restriction requirement filed on November 3, 2003, claims 26, 29-33 and 35 have been amended, claims 1-25, 34 and 36-52 have been cancelled, and new claims 53-73 have been added, thus, claims 26-33, 35 and 53-73 are pending. Applicant's election with traverse of Group VIII, claims 26-33 and 35, drawn to a method of inhibiting bacteria or treating a bacterial infection, comprising contacting bacterium with an inhibitor active on a polypeptide comprising SEQ ID NO:16, and an in vivo method is acknowledged, regarding election of one type of compound, applicants does not elect one type of compound, but amends the claim with an inhibitor instead of a compound. The traversal is on the ground(s) that Groups VIII and IX should be examined together because the claimed invention recites a method of inhibiting a bacterium comprising contacting the bacterium with an inhibitor "active on" a polypeptide comprising the amino acid sequence of SEQ ID NO:16 or a gene encoding said polypeptide, where the phrase "active on" is defined at page 17 of the specification, and a compound which is active on a particular target would include a compound acts on the cellular pathway, which begins with the gene sequence and ends with the functional polypeptide, thus the phrase "active on" encompasses inhibitors that act both at the polypeptide level and at the gene level; the in vivo and in vitro methodologies are co-extensive and would not place additional search burden on the Examiner; if the arguments are not found persuasive, applicants request to consider converting the restriction of gene/polypeptide, in vitro/in vivo, and the compound restriction

from a restriction of distinct inventions to species of the inventions; regarding new claims 53-73, applicants use the same argument to request an inhibitor "capable of decreasing the activity of or decreasing the expression of a polypeptide", and in vitro/in vivo should be examined together; the sequences of SEQ ID NOs:2, 16 and 18 should be examined together because SEQ ID NO:2 is a full length DnaI sequence and SEQ ID NOs:18 and 16 are tryptic fragments of SEQ ID NO:2 and the search would be co-extensive (pages 14-19 of the response). The response has been considered, the argument regarding in vitro/in vivo methodologies, the compound restriction, and SEQ ID NOs:2, 16 and 18 are found persuasive, thus the requirement of election of in vitro/in vivo, and one type of compound is withdrawn. However, regarding an inhibitor active on a polypeptide or a gene encoding the polypeptide, the argument is not found persuasive because the step of inhibiting the activity of a polypeptide and the step of inhibiting the gene expression are two different steps in the pathway, and each step involves different materials and produce different outcome, thus, the inhibitor inhibiting the polypeptide and the inhibitor inhibiting the gene encoding the polypeptide are patentably distinct. Furthermore, the specification also cites "In general, an antibacterial agent is active on an essential cellular function, often on a product of an essential gene" (page 17, lines 16-18). Therefore, Groups VIII and IX would not be examined together, and claims 26-33, 35, 53-73, and in vitro/in vivo, an inhibitor active on polypeptide or an inhibitor decreasing the activity of a polypeptide, and SEQ ID NOs:2, 16 and 18 are examined.

Informalities

The disclosure is objected to because of the following informalities:

3. The abstract of the disclosure does not commence on a separate sheet in accordance with 37 CFR 1.52(b)(4). A new abstract of the disclosure is required and must be presented on a separate sheet, apart from any other text.

4. The specification cites a web address (at page 12, line 4; page 45, line 1; page 46, line 20; page 84, line 4) in the form of a hyperkink and/or other forms of browser-executable code, which is impermissible and requires deletion. Appropriate correction is required.

5. The title of Table 1 is partially covered by black patch, please resubmit Table 1.

Objection to Drawings

6. Figure 2 is objected to because the figure contains 13 drawings indicating a complete nucleotide sequence of SEQ ID NO:3, thus Figure 2 should list as Figure 2A, 2B,.....and 2M. Correction is required. See also Fig 6.

7. The term used to label Figure 7B is not clearly shown. Correction is required.

8. Fig. 11 is objected to because the conditions describing the mass spectrum analysis are too small to read. Correction is required.

9. Fig. 12 is objected to because Fig. 12 is not indicated for A-C. Correction is required.

10. Figure 14A shows "C" in the drawing. Correction is required.

Claim Objections

11. Claims 26-33, 35 and 53-66 are objected to because the claim contains recitation of non-elected invention, an inhibitor active on gene encoding the polypeptide or an inhibitor capable of decreasing the expression of a polypeptide.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

12. Claims 26-33, 35, 53-73 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a method of inhibiting a bacterium, staphylococcus aureus (S. aureus) in vitro, comprising contacting the bacterium with a specific inhibitor such as bacteriophage 77 ORF 104 peptide (SEQ ID NO:5) which acts on, bind to, or decreases the activity of a polypeptide comprising SEQ ID NO:2, SEQ ID NO:16, or SEQ ID NO:18, or its functional fragments or variants, does not reasonably provide enablement for a method of inhibiting a bacterium, comprising contacting the bacterium with an inhibitor which acts on, binds to, or decreases the activity of a polypeptide comprising SEQ ID NO:2, SEQ ID NO:16, or SEQ ID NO:18, or its functional fragments or variants, or a method of treating or preventing (not even occurs at the first time) a bacterial infection in an animal, comprising administering an inhibitor which acts on or decreases the activity of a polypeptide comprising SEQ ID NO:2, SEQ ID NO:16, or SEQ ID NO:18, or its functional fragments or variants, where the structure of the inhibitor is not defined. The specification does not enable a person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

Claims 26-33, 35, 53-73 are directed to a method of inhibiting a bacterium, comprising contacting the bacterium with an inhibitor which acts on, binds to, or decreases the activity of a polypeptide comprising SEQ ID NO:2, SEQ ID NO:16, or SEQ ID NO:18, or its functional fragments or variants (claims 26-30, 65-73) or a method of treating or preventing a bacterial infection in an animal, comprising administering an inhibitor which acts on or decreases the

activity of a polypeptide comprising SEQ ID NO:2, SEQ ID NO:16, or SEQ ID NO:18, or its functional fragments or variants (claims 31-33, 35, 53-64). The specification, however, only discloses cursory conclusions (pages 4 and 7-9) without data supporting the findings, which state that the present invention relates to a pair of interacting proteins, a growth-inhibitory bacteriophage 77 ORF 104 gene product that interacts with S. aureus DnaI polypeptide, the interacting regions of the S. aureus DnaI related protein and the protein encoded by the bacteriophage 77 ORF 104, forming the basis for screening assays to identify a compound that is active on a polypeptide comprising the amino acid sequence of SEQ ID NO:16, and for a method of inhibiting a bacterium, or treating or preventing a bacterial infection in an animal using the compound. There are no indicia that the present application enables the full scope in view of a method of inhibiting a bacterium, or treating or preventing a bacterial infection in an animal using an inhibitor that acts on or decreases the activity of a polypeptide comprising SEQ ID NO:16, or its functional fragments or variants as discussed in the stated rejection. The present application provides no indicia and no teaching/guidance as to how the full scope of the claims is enabled. The factors considered in determining whether undue experimentation is required, are summarized in In re Wands (858 F2d at 731,737, 8 USPQ2d at 1400,1404 (Fed. Cir.1988)). The factors most relevant to this rejection are the breath of the claims, the presence of working examples, the state of the prior art and relative skill of those in the art, the unpredictability of the art, the nature of the art, the amount of direction or guidance presented, and the amount of experimentation necessary.

(1). The breadth of the claims:

The breadth of the claims is broad and encompasses unspecified variants regarding the inhibitor that acts on, binds to, or decreases the activity of a polypeptide comprising SEQ ID NO:2, SEQ ID NO:16, or SEQ ID NO:18, or its functional fragments or variants; and the treating conditions and the effects of the inhibitors in a method of inhibiting bacterium either in vitro or in vivo, or of treating or preventing a bacterial infection in an animal, which are not adequately described or demonstrated in the specification.

(2). The presence or absence of working examples:

The specification indicates expression of bacteriophage 77 ORF 104 inhibits bacterial growth and identifies its nucleotide and amino acid sequences (Example 1, Fig. 4); the S. aureus DnaI homolog is identified the host target of bacteriophage 77 ORF 104 (Example 2); and the specific domain of S. aureus DnaI (residues of 150-313 of SEQ ID NO:2, SEQ ID NO:16; or residues of 64-313 of SEQ ID NO:2, SEQ ID NO:18) or the proteolytic fragments of SEQ ID NO:2 are identified as regions interacting with bacteriophage 77ORF104 (Example 3, Fig. 14C). However, there are no other working examples indicating the effects of various inhibitors in the claimed method.

(3). The state of the prior art and relative skill of those in the art:

The related art (references shown at pages 2-3 of the specification) indicates S. aureus has been successfully treated with the penicillin derivative Methicillin in the past, but it is now becoming increasingly resistant, and it is not uncommon to isolate S. aureus strains which are resistant to most of the standard antibiotics, thus there is a need for new anti-microbial agents for this organism. However, the general knowledge and level of the skill in the art do not supplement the omitted description, the specification needs to provide specific guidance on the

treating conditions and the effects of the inhibitors in a method of inhibiting bacterium, or treating or preventing a bacterial infection in an animal to be considered enabling for variants.

(4). Predictability or unpredictability of the art:

The claims encompass many structural variants of the inhibitors that act on or decrease the activity of a polypeptide comprising SEQ ID NO:2, SEQ ID NO:16, or SEQ ID NO:18, or its functional fragments or variants, but the effects of the inhibitors in the claimed methods are not demonstrated in the specification, the invention is unpredictable regarding the effects of various inhibitors in inhibiting bacterium, or treating or preventing a bacterial infection in an animal.

(5). The amount of direction or guidance presented and the quantity of experimentation necessary:

The claims are directed to a method of inhibiting a bacterium or treating or preventing a bacterial infection in an animal, comprising contacting the bacterium with an inhibitor or administering an inhibitor to the animal which acts on or decreases the activity of a polypeptide comprising SEQ ID NO:2, SEQ ID NO:16, or SEQ ID NO:18, or its functional fragments or variants. The specification indicates the invention is based on the discovery that DnaI is a target for the bacteriophage 77 ORF 104 inhibitory factor, and the interaction between these two proteins is useful in the development of antibacterial agents, e.g., DnaI as a target for bacterial inhibition; phage 77ORF104 or derivative or functional mimetic thereof as agents for inhibiting bacterial growth; and the interaction between DnaI of S. aureus and 77ORF104 used as a target for screening and rational design drugs or antibacterial agents (last paragraph at page 67). The specification also indicates expression of bacteriophage 77 ORF 104 inhibits bacterial growth (Example 1, Fig. 4); the S. aureus DnaI homolog is identified the host target of bacteriophage 77

ORF 104 (Example 2); and the specific domain of S. aureus DnaI (residues of 150-313 of SEQ ID NO:2, SEQ ID NO:16; or residues of 64-313 of SEQ ID NO:2, SEQ ID NO:18) and the proteolytic fragments of SEQ ID NO:2 are identified as the region interacting with bacteriophage 77ORF104 (Example 3, Fig. 14C). However, the specification has not demonstrated various inhibitors that act on, bind to, or decrease the activity of a polypeptide comprising SEQ ID NO:2, SEQ ID NO:16, or SEQ ID NO:18, or its functional fragments or variants in the claimed method except for 77 ORF 104 peptide inhibiting the growth of S. aureus in vitro, and there are no other working examples indicating the claimed methods associated with various inhibitors. Furthermore, the specification has not indicated the treating conditions such as the amount of inhibitor used for preventing the bacterial infection, and how to monitor the effect of inhibitor if the infection is prevented to occur, nor has demonstrated the effects of various inhibitors either in vitro or in vivo testing. Since the specification does not provide sufficient teachings in the method of inhibiting bacterium or the treatment or prevention of bacterial infection using various inhibitors, it is necessary to have additional guidance and to carry out further experimentation to assess the effects of inhibitors in inhibiting bacterium or in the treatment of bacterial infection.

(6). Nature of the Invention

The scope of the claims includes many structural variants of inhibitors, however the specification has not provided sufficient teachings on the treating conditions, nor has demonstrated the effects of inhibitors. Thus, the disclosure is not enabling for reasons discussed above.

In summary, the scope of the claim is broad, while the working example does not demonstrate the claimed methods associated with variants, and the teaching in the specification

is limited, therefore, it is necessary to have additional guidance and to carry out further experimentation to assess the effects of inhibitors in inhibiting bacterium or in the treatment of bacterial infection.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

13. Claims 26-33, 35 and 53-73 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

14. Claims 26-33, 35 and 53-73 are indefinite because the claim lacks essential steps in the method of inhibiting a bacterium or treating a bacterial infection. The omitted steps are outcome of the treatment for claims 26-33, 35 and 53-73, and an effective amount of inhibitor used for claims 26-30 and 53-64. Claims 27-30, 32, 33, 54-58, 60-64 and 68-73 are included in this rejection for being dependent on a rejected claim and not correcting the deficiency of the claim from which they depend.

15. Claims 29, 32, 57 and 63 are indefinite because of the use of the term "a fragment or derivative of a bacteriophage inhibitor protein". The term "a fragment or derivative of a bacteriophage inhibitor protein" renders the claim indefinite, it is not clear what fragment of the bacteriophage inhibitor protein is, what compound the derivative of the bacteriophage inhibitor protein is, and how different the derivative is from the parent protein.

Conclusion

16. No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Min Kam whose telephone number is (571) 272-0948. The examiner can normally be reached on 8.00-4:30, Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher Low can be reached on (571) 272-0951. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 308-4227 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.

Chih-Min Kam, Ph. D. CMK
Patent Examiner

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January 19, 2004

ROBERT A. WAX
PRIMARY EXAMINER